Launch Services Program

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Launch Services Program

Our Mission: Leadership and expertise in providing on-time, on-orbit, and on-cost launch services. The NASA Launch Services Program (LSP) is responsible for launching NASA payloads into space using expendable rockets. The payload may be a satellite observatory going to Low-Earth orbit or send a spacecraft on a mission to explore other planets or objects in our solar system.

Launch Services Specialist: The "Launch Services Specialist" works with 30 mission teams to "get the word out" about the increasingly important role the Launch Services Program has in launching scientific and robotic missions into outer space. The LSP Specialist cooperates & assists NASA's External Affairs organization with building web casts, producing & directing videos, developing internal web site content, and providing video script oversight. The Specialist's end products are available for viewing on NASA web sites and NASA television. Additionally, the Specialist: Is Editor of the internal newsletter, "Launch Services Connections", designs effective customer feedback surveys, prepares community leaders outreach presentations for the LSP Program Manager, and manages money budgeted for the "Launching Rockets" web site.

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Mission Life Cycle

Spacecraft Project & Launch Service Program: Each NASA spacecraft / payload project formulation and implementation utilizes the project life cycle process. The mission life cycle process serves as a roadmap for support to and integration by Launch Services Program (LSP) with each mission customer. Mission development phases, involving integrated spacecraft and LSP efforts, parallel the spacecraft project life cycle process in the map to follow.

Mission Integration Manager (MIM): Responsible for contractual agreements and contract modifications between the NASA Launch Services Program and the private launch services contractors (Boeing, Lockheed-Martin, Orbital Sciences, etc). The MIM is involved very early in the mission, taking over from the Advance Planning Manager. Once the Program provides the Authorization to Proceed (ATP) with a launch services contract, the proposed spacecraft becomes a NASA mission. The MIM is the leader of the Mission Integration Team (MIT) and is ultimately responsible to the Launch Services Program Manager for the successful performance of the launch services contract.

Deputy Program Manager: A Deputy Program Manager is the second in command in the NASA management chain, working side by side with the Program Manager, who is ultimately responsible for the entire organization. The Deputy acts as a backup to the Program Manager, many times performing the same duties as the Program Manager. They manage the people and contracts involved in the rocket launches. Program Managers usually start as systems engineers performing day to day engineering jobs. Those engineers who continue with their studies into higher education (graduate school) improve themselves and have a chance to get promoted through the ranks, all the way up to program managers.

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Pre-Mission Planning

Length: Launch -4 to -10 years: In this phase of the mission, we support the spacecraft mission design with launch service information. The launch date and launch site is selected and we help the spacecraft team select a launch vehicle. At this time a preliminary list of mission unique requirements are defined.

Advance Planning Manager: Responsible for early planning for the launch mission integration process. It starts with a mission concept definition, usually by a group scientists and engineers from NASA, universities or government research institutions who have an interest in solar, planetary, earth science, or space communications. This concept is translated into a spacecraft design. Advance planning helps ensure that all common integration requirements are understood by both the spacecraft and the rocket early in the integration process.

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Mission Planning

Length: Launch -3 to -4 years: In this phase, we refine spacecraft customer requirements and prepare the acquisition strategy for the launch service. We identify support services and estimated costs, establish dates for spacecraft delivery and complete a launch vehicle assessment.

Mission Integration Manager (MIM): Responsible for contractual agreements and contract modifications between the NASA Launch Services Program and the private launch services contractors (Boeing, Lockheed-Martin, Orbital Sciences, etc). The MIM is involved very early in the mission, taking over from the Advance Planning Manager. Once the Program provides the Authorization to Proceed (ATP) with a launch services contract, the proposed spacecraft becomes a NASA mission. The MIM is the leader of the Mission Integration Team (MIT) and is ultimately responsible to the Launch Services Program Manager for the successful performance of the launch services contract.

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Baseline Mission & Procure Launch Services

Length: Launch -2 to -3 years: In this phase, we sign the launch service contract, which includes how much the launch will cost. All the support requirements and details of the agreement are also included in the contract at this time, we have agreed with the spacecraft final design and launch vehicle selection. The mission plan and schedules are completed.

Program Integration Manager - Contracting Officer Technical Representative - COTR:
Program Integration Manager (PIM) for the NASA Launch Services (NLS) Contract
Provide program and business management for the NLS contract including specialized support in procurement and resource management. Responsible to insure budgets are in place and requirements are contractually implemented for the NASA missions.
As COTR, responsible to work cross-mission, technical, and programmatic issues with the launch services contractor and NASA. Serves as technical liaison between the contractor and the NASA contracting officer.

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L/V & S/C Engineering Manufacturing

Length: Launch -3 years to -3 months: In this phase, we start launch vehicle manufacturing and perform all the engineering analyses to verify the spacecraft and the launch vehicle will fit and work with one another. All launch vehicle components are manufactured and delivered to the launch site. The spacecraft is built and tested by the customer.

Vibrations Analyst: Vibrations Analysis is a specialty within aerospace/mechanical engineering and involves simulating the launch environment (acceleration, vibration, shock and acoustic forces) in a computer. These launch environment parameters are applied to finite element computer models of the spacecraft and rocket. The analyst must predict the responses of the combined spacecraft/vehicle to verify they will both survive the launch and the spacecraft can be safely delivered to the intended orbit.

Integration Engineer - System Engineering and Integration: Ensure interfaces between the launch vehicle and spacecraft are defined and documented in the Interface Control Document (ICD). Verify the ICD requirements and specifications are properly implemented during the integration of the spacecraft on to the launch vehicle. Spacecraft integration involves installing nuts and bolts, connecting electrical and instrumentation cables, air conditioning ducts, and completing any mission unique requirements of the spacecraft to the launch vehicle. The integration process continues during all pre-launch tests of the vehicle and spacecraft, finally ending after the launch, when the spacecraft separates from the launch vehicle and into the correct orbit.

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Launch Site Ops & Launch Campaign

Length: Launch -3 months to -10 days: In this phase, the customer ships the spacecraft to the launch site and start getting it ready to fly. This includes the final test and check out of the spacecraft systems. At the same time, the launch vehicle is assembled at the launch pad and prepared to receive the spacecraft.

Instrumentation Engineer: Monitor the condition of launch vehicle (rocket) systems during pre-launch testing, final countdown and powered flight. Instrumentation consist of sensors that monitor the status of the vehicle subsystems, (e.g. guidance, navigation, propulsion, power distribution, telemetry transmitters, flight termination system, etc.) by monitoring key performance parameters like, acceleration, voltage, current, temperature, pressure, etc.

Launch Site Integration Manager LSIM: Launch Site Integration Manager (LSIM) is the spacecraft's liaison at the launch site. Responsible for preparing the processing facilities, services and support equipment the spacecraft will need once it arrives at the launch site. The LSIM is responsible for the spacecraft requirements during offline (before integration to the launch vehicle) activities and processing. Assist spacecraft team with procedure approval; line up support services and supplies, as well as spacecraft personnel clearance, office space, clerical support, etc.

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Launch

Length: Launch -10 days to launch: In this phase, the spacecraft gets installed onto launch vehicle. We finish the vehicle and engineering reviews and analyses. The final NASA readiness reviews and meetings are performed. Then we go into the final countdown and launch vehicle into earth orbit or the required trajectory, if it is a planetary mission.

Mechanical Engineer or Electrical Engineer: Responsible for launch vehicle mechanical and propulsion (or electrical) systems. Follow manufacturing, assembly and integration of mechanical (or electrical) systems and components to insure compliance with technical specifications and standards. Participate in hardware acceptance reviews, qualification tests and integration procedures. Evaluate manufacturing and test results and review non-conformance reports. If the non-conformance is considered mission critical, prepare a presentation package explaining the problem resolution and present to NASA Engineering Review Board (ERB) for concurrence. Responsible for the resolution of any recommendations and action items from the ERB. During launch countdown, monitor vehicle systems and determine readiness for launch. Provide "GO / NO GO for Launch" recommendation to NASA Chief Engineer.

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Post Launch

Length: Launch +3 months: After launch, we check how well the launch vehicle worked and prepare the mission success report. We support spacecraft equipment packing and shipping and process the final payment to launch services contractor.

Lead Telemetry Engineer: Support telemetry processing for Expendable Launch Vehicles. Telemetry (measuring at a distance) is the vehicle sensor data radiated from the rocket, down to ground stations. Ground stations receive this "telemetry stream", record and store it for post launch processing and detailed analysis. Telemetry processing involves a network of computers, recorders and video screens used to display the data to systems engineers and launch managers.

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